Pacific Northwest Garlic Mustard Working Group

Highlights from Recent Collaborations



***Contributors*:* ALASKA:** Melinda Lamb (Juneau USFS), Brian Maupin (Southeast SWCD) **OREGON:** Chris Aldassy, Lucas Nipp, Jon Wagner (East Multnomah SWCD); Mitch Bixby (City of Portland, Bureau of Environmental Services); Michelle Delepine (West Multnomah SWCD); Dan Durphey (Umatilla Weed Control Program), Robert Emanuel (Clean Water Services); Sarah Hamilton (4-County CWMA); Vern Holm (Western Invasives Network); Jordan Kim, Kris Schaedel (Hood River SWCD); Sam Leininger, Jeff Lesh (Clackamas County SWCD); Christina Mead (Mt Hood National Forest, USFS); Beth Myers-Shenai (ODA); Charles Nappi (Portland Parks and Rec); Sam Whiteridge (Rogue Basin Watersheds); Lindsey Wise (iMap OR) **WASHINGTON:** Denielle Cowley, Mike Monfort, Kevin Tyler (Clark County Environmental Services); Greg Haubrich (WSDA); Frances Lucero, Ed McFarlin, Karen Peterson, Sasha Shaw, Maria Winkler (King County Noxious Weed Program); Bethany Lund (Clark Public Utilities); Kyle McKune, Clark Sexton, Aaron Yanez (WSDOT); Dan Sorensen (University of Washington); Emily Stevenson (Skamania County Noxious Weed Control Program); Angelica Velazquez (Cowlitz County Noxious Weed Control Board); Bill Wamsley (Lewis County Noxious Weed Board)

Abstract

Invasive plant managers and field staff working on control of garlic mustard (Alliaria petiolata) in Oregon, Washington and Alaska recently convened to share observations, identify challenges, discuss treatment strategies and refine methodologies. Through collective sharing of observed treatment successes and deficiencies, potential improvements to control methodologies were revealed. A composite, regional view of the current work being undertaken to combat garlic mustard was also compiled. Developing a platform for future collaboration promotes timely sharing of key information and supports a region-wide effort to contain and decrease garlic mustard presence in the Pacific Northwest.

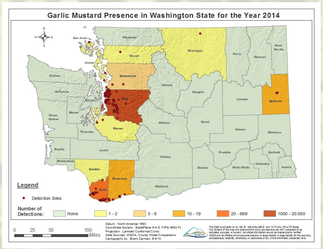
Background

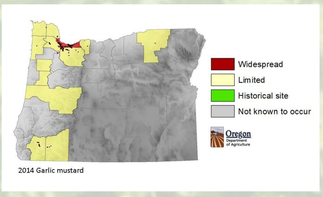
Garlic mustard has been widely characterized as one of the worst invaders of Northeast and Midwest forests. As an ecosystem modifier, garlic mustard is capable of successfully invading forest understories and becoming the dominant understory species. In the Pacific Northwest, its ecological effects are less well-studied; however, it has demonstrated the ability to invade nearly all PNW habitat types.

PNW habitats susceptible to garlic mustard:

- Heavily disturbed urban sites to healthy native forests
- Sunny, well-drained sites to shady, moist sites
-Riparian floodplains to upland forest
-Both western and eastern-sides of Cascades

The comprehensive garlic mustard management programs that have been established in the Northwest have built a thorough network of landowner participation and key infrastructure. All have met challenges, yet many also have suggestions for improving upon methodologies. There is much to be gained through direct collaboration between garlic mustard managers of the Pacific Northwest.





2014 Garlic mustard

Content presented reflects discussion from a day-long working group gathering, and email and phone correspondence.

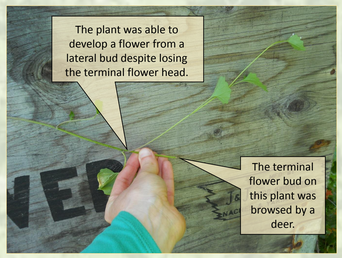
Objectives

- **Establish a regional view of garlic mustard's known presence & extent**
- **Identify and communicate current management & outreach approaches**
- **Share observations of what appears to be working and not working**
- **Identify limitations, challenges and opportunities for improvement**
- **Share tools for better managing data, contacts, mapping**
- **Build networking abilities to promote timely sharing between agencies and jurisdictions**
- **Discuss and coordinate ongoing and future strategies, at various geographical scales**

Compiled by Michelle Delepine, with photos by Chris Aldassy, Mitch Bixby, Jordan Kim, Jeff Lesh & Kris Schaedel
Washington Map by Greg Haubrich – WSDA, *Oregon* Map by Beth Myers-Shenai – ODA

Challenges

- Variable and adaptable phenology (flowering period, stature, axillary growth)
- Wide ecological aptitude (demonstrated ability to invade nearly all habitats)
- Seed bank longevity (occurrence of new plants after several years of preventing seed production)
- Treatment challenges (flowering may occur incrementally, siliques may continue to produce seed post-treatment, lateral regrowth)
- Coordination and sharing between many entities and mapping/reporting platforms




1-year plant? Very small flowering stem


3-year plant? Regrowth from woody base


Endurance of siliques following treatment

Discussion

- **Outreach** – Most have generally had good success with landowner participation and public reception.
- **Management Strategy** – Most entities aim to control all known populations; however, there are some exceptions.
- **Survey** – Entities generally rely on a three-pronged approach with 1) proactive mailing campaigns to high-risk property owners 2) field surveying and 3) training volunteer weed watchers.
- **Results** – Overall, the consensus was that control programs appear to be curtailing spread from established management zones. Relatively few new invasions have been discovered outside active management areas. While some do not report decline in population density, more have seen declines in density following 2-3 years of treatment.
  - Recheck sites during the flowering stage.
  - Decreasing the size of the impacted area is more difficult than reducing density.
  - Areas on the leading edge of invasions with less established populations were observed to respond better to control efforts.

Control

Integrated Pest Management – Observations and Suggestions

- Prevention is key—have good protocols in place to inhibit off-site transfer of seed (residual in soil)
  - standardize contractor language on prevention protocol
  - install boot brush stations in public areas and utilize wash stations to remove hardpacked soil

- Fall application of 1% triclopyr to rosettes has been shown to be effective
- Apply foliar spray to ripening seedpods; it has been observed that this inhibits continued seed maturation
- Consider clipping off seedheads prior to herbicide application to minimize seed production
- During rainy conditions when foliar application is not permissible, it may be prudent to handpull or cut flowerheads and return later to spray if there is concern about making the most of a limited treatment window
- Most agree that it is desirable to control not just flowering plants, but rosettes, too
- Hemlock mulch may suppress mustard species, including garlic mustard. Successes with this cultural practice have been observed, but requirements include replenishing supply after 2yrs and maintaining a mulch depth of 6"
- Herbicide Selection:
  - Triclopyr: Phenotypic response is usually visible within a few days, which is often desirable. Compared to glyphosate, triclopyr is thought to work faster on seedpods to prevent continued seed production following application. As a broadleaf herbicide, triclopyr does not affect grasses.
  - Glyphosate: Usually provides good systemic control. As a slower-acting herbicide it can take up to 2-3 weeks to cause mortality. Some agencies elect to use it only during early flowering and switch to using triclopyr during silique formation. Concerns expressed with possible resistance to use of glyphosate alone.
  - Aminopyralid: Observed to show good rosette control, but leads to topkill and root crown resprouting when applied to flowering individuals.
  - Imazapyr: Less widely-used for garlic mustard, but preliminary observations look promising. May also provide some residual control.

Next Steps

- **Collaborate**: Develop and facilitate infrastructure for sharing between management staff across region in list-serv and meeting formats
- **Share:** Data, mapping, outreach and treatment challenges/successes
- **Research:** More scientific study is needed on the behavior and adaptability of garlic mustard to growing conditions of the Pacific Northwest
- **Adapt:** Refine methodologies; Evaluate strategies on local and regional scales

Contact

- For more information on content, please contact Michelle Delepine (michelle@wmswcd.org)
- For interest in participating in any future collaborations, please contact Vern Holm (weeds@cascadepacific.org)

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